



2018 ANNUAL REPORT

PROCESS OPERATIONS

During the year 2018, the Operations department treated 7,051,400,000 gallons of domestic and industrial wastewater. This was treated at an average daily flow of 19.3 million gallons. The annual removal of Total Suspended Solids (TSS) was 97%. The annual removal of Carbonaceous Biochemical Oxygen Demand (CBOD) was 96%, Ammonia removal was 100%, and Phosphorous removal was 83%.

In the year 2018, we removed and disposed of 143 tons of inorganic material known as grit. We were also able to remove 220 tons of screenings from the incoming waste stream, saving a great deal of wear and possible repairs to the pumps and other equipment.

The primary portion of the treatment process removed 23,219,600 gallons of raw sludge from the process; the biosolids were treated in the digesters and during the digestion process pathogenic bacteria is destroyed. The biosolids decomposition also converts mass into methane gas, which is used to heat the boilers, buildings and the digesters. The gas production daily average is 69.36 ft³.



Samples

By maintaining the proper temperatures, mixing and pumping rates, the methane produced saved the City thousands of dollars. After the biosolids have been properly digested it is then sent to the digested biosolids storage tanks. From there it is ready for our City's biosolids land application program.

The secondary portion of the plant is biological and called the waste activated sludge process. The biological mix in the secondary process contains living micro-organisms that consume the waste and bacteria as it is introduced to the

wastewater. This process is very effective and efficient. There are many growth factors that impact this process. They include pH, detention time, oxygen levels, temperature, toxicity, and strength of waste. Excess biological mix is sent to the gravity belt thickeners where a polymer is added, which causes the mix to flocculate (from 0.5% to 5.0%). After the mix flocculates, this allows the excess water to pass through the porous belt and then travel to the primary clarifiers for treatment.

The thickened waste is then pumped to the anaerobic digesters for decomposition. 53,441,000 gallons of activated waste was sent to the gravity belt thickeners in 2018. Of the total number of gallons sent to the gravity thickeners, 43,329,700 was water which was removed and sent back to the primary process. The remaining 10,111,300 gallons was thickened and sent to the digesters.

The City of Lafayette has one of the most advanced treatment facilities in the country. With the dedicated staff we have, we will continue to do our part to keep the Indiana rivers and streams clean.



Wonders on the Wabash

STORMWATER

In 2018, the street sweepers continue to be a vital piece of equipment in our effort to get sediment off the roadways. It is imperative to reduce the amount of sediment on the roadways to keep it from entering our waterways. For 2018, the street sweepers removed an estimated 2,596 tons of sediment off the roads.

Stormwater has employees that hold certifications as Certified Erosion, Sediment and Storm Water Inspector (CESSWI) and Certified Inspector of Sediment and Erosion Control (CISEC). Stormwater employees conduct pre-construction, active construction, and post construction inspections. These inspections are performed on a weekly basis year round. In 2018, Stormwater inspectors performed 1,748 erosion control inspections.

Stormwater crews continue to perform annual inspections on all Best Management Practices (BMP's). BMP's trap sediment and other pollutants and prevent waterways from being contaminated. We inspect all BMP's located within the City; the structures that are currently owned by the City are inspected and cleaned, if required. Privately owned BMP's are inspected and, if maintenance is needed, the owner is notified to do so and then re-inspected. During 2018, Stormwater crews performed 92 BMP inspections. Of the 92 BMP's, 56 of these were city owned and maintained. Of those 56 owned by the city, eight required maintenance in 2018, which was performed by the Stormwater department.

We continued our efforts in monitoring the Illicit Discharge Detection and Elimination (IDDE) program. In 2018, only one illicit discharge was reported/discovered and added to our IDDE list to be corrected. To date, 77 illicit discharges have been corrected.

Stormwater crews continue to perform inspections and maintenance on all City owned bio-swales and rain gardens. Necessary maintenance is performed on a regular basis.

In 2018, we continued to work on our Preventative Maintenance Program for the Stormwater Collection System. All City of Lafayette owned storm structures are inspected and cleaned during this maintenance program. By being proactive and implementing this program, we hope to reduce the risk of potential costly issues in the future. This maintenance program was put in place and started in October 2013. The City is mapped into grids and currently there are 186 grids within City limits. It is the goal of the Stormwater department to complete inspections and cleanings in all 186 grids in a five-year span, at which time we will start the cycle over. In April of 2018, the Stormwater department started the second rotation of its five-year goal of cleaning the catch basins within the city limits. There were 886 catch basins cleaned as part of the Preventative Maintenance Program in 2018.

In 2018, Lafayette Renew Stormwater and Collections staff installed 1308 feet of storm pipe ranging in size from 12-inch to 24-inch. Also installed were 16 storm structures, eight catch basins, and eight manholes. Additionally, the Stormwater staff installed silt fence, rock check dams, inlet protection, construction entrance, and silt worm logs as BMP's and continued to perform the maintenance on them throughout the year.

In 2018, Major Projects Completed – Stormwater took on maintenance of the following areas:

- Sagamore Parkway Phase III – maintain the green infrastructures
- Valley Street (10th Street & Digby Road to 14th Street & Congress Street) – Pipes, roadside ditches and the green infrastructures maintenance
- 1,745 feet of roadside work bank stabilization at various locations
 - Valley Street Project from 10th Street to 14th Street - 1,725 feet
 - Sagamore Parkway & McCarty Lane detention pond – 20 feet



Sagamore Parkway Phase III



Stormwater employees attended several workshops and training seminars throughout the year:

- Indiana Local Technician Assistance Program (LTAP) Stormwater Drainage Conference
- Indiana Association for Floodplain Management (INAFSM)
- Contractors Training Workshop at Ivy Tech Community College
- Wastewater Operators Training
- Good Housekeeping for Stormwater at Ivy Tech Community College
- Municipal Separate Storm Sewer System – MS4 Annual Conference
- Wabash River Heritage Corridor Commission
- Snow Plow Training
- Safety Training

Daily work activities that Stormwater employees performed throughout the year:

- Vac-cleaned catch basins
- Raised storm manholes
- Repaired/patched storm lines and installed new storm lines
- Installed traps in catch basins for odor control measure
- Erosion and sediment control inspections performed
- Bank stabilization for erosion problems
- Roadside grading
- Televised and dye tested numerous storm lines
- Performed manhole bladder inspections
- Maintenance on conveyances channels, ditches, concrete and bio-swales, silt trap, etc.
- Monitored combined sewer overflow points
- Snow plowed areas assigned to Lafayette Renew
- Street sweepers assisted Street Department with leaf pick-up
- Performed river sampling at Wabash River with Wabash River Enhancement Corporation (WREC)
- Weekly inspections and maintenance performed at Storm Park
- Grass mowed at various locations owned and maintained by our department

2018 STORMWATER CALLS	
Erosion Control Inspections	1748
Stormwater Calls	47
Sweeper Calls	149
Catch Basins Calls	84
Catch Basin Areas - Grate Cleaning	49 times
Catch Basins Cleaned – Vac Truck	1005
Catch Basins Repaired	80
Catch Basins Installed	22
Catch Basin Line Repaired	15
Storm Man Holes Installed	23
Ft. of New Storm Sewer Installed	4,669
Ft. of Storm Sewer Repaired	147
Storm Sewer Jet Cleaned	5,926 feet
Storm Sewer Televised	12,513 feet

Lafayette Renew also serves as a member of the Tippecanoe County Partnership of Water Quality (TCPWQ). The TCPWQ provides education, information, and outreach to improve the quality of the county's waters. The Wabash River, as well as all creeks and streams that feed it, are vital to maintaining an environmentally and economically viable community. The TCPWQ has produced and sponsored several videos stressing stormwater requirements and protecting our local waterways for public education and awareness. The Stormwater department plays a key role informing and educating the public within the City of Lafayette. The Stormwater department will visit schools and discuss ways that families can help do their part (rain barrels, rain gardens, car washing, lawn fertilizing, etc.) Since the inception of the Rain Barrel Program in 2012, the Stormwater department and Wabash River Enhancement Corporation have partnered together to help get rain barrels out to approximately 840 residences within our watershed. Throughout the year, several tours were given at the Durkees Run Stormwater Park and various green practices. Riverfest is an annual event to help promote river awareness; it attracts a large number of people every year. Lafayette Renew helps staff this event with several volunteers that interact with the public and educates them on the benefits of preserving our waters.

Videos sponsored by TPCWQ:

- Stormwater Pond Maintenance for Homeowners
- MS4 for Elected Officials: Why is Stormwater Quality Important for Your Community
- Stormwater Quality: Inspections
- Blue is the New Green
- Proper Concrete Washout Procedures for Contractors
- Proper Refueling – Keeping Our Waterways Clean
- Construction Site - Best Management Practices



2018 Wabash Riverfest



SURVEILLANCE/PRETREATMENT

The City currently has 14 significant industrial users and four general industrial users permitted with its pretreatment program. The Surveillance department monitors and inspects these industries to ensure all permit limitations are being met. This involves inspecting the facilities annually, monitoring their wastewater quarterly, reviewing the industries' self-monitoring data, and communicating with the industries on permit compliance and environmental topics. The City then reports to IDEM and the EPA on the industrial users' status.

Further monitoring, as required by the City's NPDES permit, which includes Priority Pollutants and Whole Effluent Toxicity testing, is conducted by the Surveillance department. This additional monitoring is done to ensure the commercial and industrial discharges are not negatively impacting the treatment plant or the Wabash River.

On July 14, 2017, the EPA established Regulations for dental offices to reduce mercury found in amalgam fillings from being discharged to the Lafayette Renew Treatment Plant and getting into the environment. The City requires dental offices to fill out and submit a One Time Compliance Report (OTCR) to document that the facility has an amalgam separator and procedures are in place to maintain it. Existing Dental Offices have until July 14, 2020 to comply, while new dental offices must be in compliance before discharging to the City.

The Surveillance department is also responsible for the commercial trap program which involves inspecting and monitoring the City's commercial businesses. This involves plan reviews and installation inspections of new commercial businesses, along with inspecting over 500 grease interceptors and oil & grit separators at existing commercial facilities.



The City's Surveillance department was responsible for other activities throughout the year which included river, ditch and creek sampling, dye testing for commercial and residential billing audits, investigating and tracking down unusual discharges coming into the plant, complaints of illegal dumping, participating in the Wabash River Blitz semi-annually, and assisting with plant tours.

BIOSOLIDS LAND APPLICATION PROGRAM

The City's land application program provides a mutually beneficial service to both the City and the landowner. The City benefits by being able to land apply the biosolids on local farm ground and the landowner receives the biosolids as a form of fertilizer. In 2018, approximately 9.9 million gallons of biosolids were applied to 509 acres of farm ground, which had fertilizer value of approximately \$180,307. Additionally, the City belt pressed 233 dry tons of biosolids, which were hauled to an offsite regional biosolids center for later land application.

With the City generating additional biosolids as a result of total phosphorus regulations, alternative biosolids thickening methods are needed for when land application cannot take place due to field conditions or weather. In 2018, the City pilot tested a volute press as another potential method for thickening biosolids. These alternative methods can thicken the liquid biosolids into a solid material, which reduces the volume of biosolids to be land applied or stored.

Biosolids that are land applied are tested to certify that they meet all State and Federal Regulations. The testing performed on the biosolids includes pH, pathogens, vector attraction, total solids, nutrients, and metals. This assures a beneficial by-product for land application and provides the landowner with valuable nutrient information. The department is also required to soil sample each field in the program every two years. The soil sample results must meet certain regulations and are then provided to the farmer to help in crop planning.

Other Lafayette Renew programs help play a vital role in ensuring the biosolids meet regulations for land application. These other programs are responsible for monitoring the collection system, industrial and commercial establishments, and miscellaneous waste streams to prevent pollutants from getting into the City's sewer system and ultimately into the biosolids at the Lafayette Renew Treatment Plant.



COLLECTION SYSTEM

The City of Lafayette has added 1.39 miles of sanitary and storm sewers within the collection system in 2018, bringing the total of sanitary, storm and combined sewers to 479.09 miles of collection system serving the City of Lafayette and parts of Tippecanoe County. Currently, there are 12 employees that are responsible for the maintenance of the system, which includes cleaning, root cutting, repairing, televising and inspecting.

In 2018, there was one major failure in our collection system on Grove Street due to a deteriorating line. 1,156 feet of sewer was replaced and house laterals were reconnected.

2018 Collection System Calls	
Backup	169
City Blockages	16
Sanitary	152
Odor	25
Rodent Baited	1
Tap Inspections	365
Sewer Locates	17,326
Total 2018 Collection System Calls	18,054

Collection system employees completed various safety training courses. Ongoing preventative maintenance of sanitary sewers included water jetting each line for cleaning, manhole inspections, and map corrections. Preventative maintenance is performed annually to decrease the potential for sewer issues. 15 sewer lines repairs were made in 2018. We were also responsible for the snow removal in Areas 8, 9, and 11 and also assisted the Street Department in other areas of the City as needed. Employees assisted with snow removal at the plant and lift stations.

Preventative Maintenance 2018			
Regulators Inspected	65	LF Sewer Jet Cleaned	356,456 feet
Sanitary Manhole Frames Raised	19	Total Manholes Jet Cleaned	1,417
LF New Sewer Installed	324 feet	Total Manholes Vac Cleaned	517
LF Sanitary Sewer Repaired	45 feet	LF Sewer Televised	90,355 feet
Manholes Repaired	14	LF Sewer Root Cut	30,473 feet

Storm and Sanitary Sewer Inspections

Lafayette Renew conducted storm and sanitary structure inspections on all projects and provided the contractors with punch lists for all structures inspected. They observed and approved all air, mandrel, and television inspections performed on the storm and sanitary sewer pipe. The following tables summarize storm and sanitary projects.

2018 Privately Developed Projects Accepted By the City for Maintenance	
Sanitary Structures	35
Sanitary Pipe	7,381 feet
Storm Structures	18
Storm Pipe	1,479 feet

2018 Privately Developed Projects to Remain Privately Maintained	
Sanitary Structures	28
Sanitary Pipe	4,095 feet
Storm Structures	108
Storm Pipe	11,476 feet



MAINTENANCE

The Lafayette Renew Maintenance department performed routine maintenance at the Treatment Plant and Lift Stations in and around the City of Lafayette.

This year, the maintenance personnel removed old lighting and installed over 100 LED lights in the Administration building alone. In the near future, more lighting will be upgraded around the plant and all of the surrounding lift stations.



New lighting in the Administration Building's Main Hallway and Large Conference Room.

For the year of 2018, the Maintenance department completed 750 Preventative Maintenance orders and 485 Operations work orders.

The following projects and work were also completed in 2018:

- Assisted contractor with replacement of #1 raw sewage pump valve
- Rebuilt cross collector in #1 primary tank
- Rebuilt and installed six control valves in digester building
- Completed beautification upgrade at all lift stations (paint, new fence etc.)
- Weekly preventative maintenance, including mowing and clean-up, on 28 lift stations

Maintenance personnel also assisted with the rebuild of one screening structure at Pearl River Lift Station. There are two Hycor ROMAG screening structures at Pearl River. Their primary use is to remove debris from storm water entering the Wabash River. These structures only operate during high rainfall events.



Screening structure at Pearl River being repaired and installed.

LABORATORY

The Lafayette Renew Laboratory is staffed by two Lab Technicians and one Lab Chief. The Lab primarily serves with the Operations and Surveillance departments. The Operations department maintains the Lafayette Renew plant in efficient working order. The Surveillance department monitors local significant industrial users that discharge into the City's sanitary waste system.

Operations Support

The Lab operates seven days a week and typically performs 57 tests daily on 34 separate samples for the Operations department. Tests performed on plant samples taken from system inflow, primary treatment effluent, and final treatment effluent include: Total Solids (TS), Volatile Solids (VS), Total Suspended Solids (TSS), Volatile Suspended Solids (VSS), Settleable Solids, Biochemical Oxygen Demand (BOD), E. coli, Residual Chlorine, and pH. Respiration rates of the aeration tanks are measured regularly. The results of these tests serve as a trending indicator of the plant's effectiveness at treating sanitary wastewater. The Lab also prepares influent and effluent samples for analysis by contracted laboratories for metals such as copper, chromium, lead, and mercury.

Raw, digested, storage tank and field-applied biosolids are tested for pH, total solids, and volatile solids. Storage tank and land application solids are composited, retained, and prepared for third-party testing of metals and nutrients.

Samples from the influent, final effluent, and biosolids locations were prepared and shipped for Total Toxic Organics (TTO) analysis to a third-party lab in October. Samples from influent and final effluent locations are also collected for in-house phosphorous testing and prepared for copper analysis by third-party labs.

Each calendar quarter, known-concentration quality control standards are tested to monitor the accuracy of analytical methods employed in the Lab for each permit parameter. The results of all tests conducted in 2018 fell within acceptable limits for each standard.

Discharge Monitoring Report-Quality Assurance (DMR-QA) participation is required by the Environmental Protection Agency (EPA) under the Clean Water Act. The Lab completed DMR-QA Study 38 between March 18 through July 1. The DMR-QA program serves as a check of the accuracy of both Lafayette Renew's Laboratory and third-party laboratories that conduct tests for Lafayette Renew on a contract basis. Lafayette Renew and third-party labs passed all tests in the study. The Indiana Department of Environmental Management (IDEM) certified Lafayette Renew's Laboratory for all permit-required tests.

Surveillance Support

The number of tests performed daily increases by nearly 30% when the Surveillance department is monitoring industries and during disinfection season (April 1 – October 31). The test results of each significant industrial user's discharge track that industry's compliance with their discharge permit. The Surveillance department monitors 14 significant industries and four general industries.

Through monthly and quarterly tests, the Lab monitors the health of the watershed within the City of Lafayette. Samples from four locations in the Wabash River are monitored monthly and six locations in Elliott Ditch and Wea Creek are tested quarterly.

E. coli analyses were performed on Illicit Discharge Detection and Elimination (IDDE) samples from the Stormwater department, and as discharge source identification (sanitary or groundwater) for Combined Sewer Overflow (CSO) elimination support.

Projects Completed in 2018

As shown in Table 1, the Lab completed 34,991 tests in 2018. The Lab's daily operations continue to run efficiently and we are also able to help with special projects within other departments of Lafayette Renew. We are currently assisting with updates to Lafayette Renew's web page and social media posts to be shared on the City of Lafayette Facebook page. We also participated in the River Sampling Blitz during the spring and fall.

Forward Plan 2019

Preventative maintenance and calibration will be scheduled for all required equipment. Standard operating procedures will be reviewed and updated as needed. Training of the two new laboratory technicians that were hired in 2018 will continue.

Table 1. Test Prevalence

Ammonia-N	902
Biochemical Oxygen Demand	5,655
Chlorine/Bisulfate	888
Volatile/Alkalinity	36
E. Coli	300
pH	2,190
Plant Phosphorous	1,110
Respiration Rates	288
Settleable Solids	2,190
Special (QA/QC, DMRQA)	130
Total Solids & Total Volatile Solids (Sludge)	1,494
Total Suspended Solids & Volatile Suspended Solids	18,502
Volatile Acids & Alkalinity	36
Waste Haulers	898
Total Tests Completed	34,991

SAFETY AND ACCIDENT REVIEW

prepared by: Tom Maguire, MSI

During the 2018 calendar year, Renew personnel suffered nine personal injuries, up from five personal injuries in 2017. We had one injury resulting in lost time in 2018, as opposed to none in 2017. Renew vehicles were involved in ten vehicle accidents, resulting in generally minor damage, without any injuries to Renew personnel. This represents an increase of two from the eight vehicle accidents in 2017. There were two personal injuries resulting from environmental conditions/exposures, compared to one in 2017. The other seven injuries were from industrial/mechanical activities. In 2018, there was a single injury resulting from improper lifting practices, compared to two such injuries in 2017. In 2018, accidents attributable to slips, trips & falls, were reduced from two to one. Vehicle accidents resulting from backing and turning increased from two in 2017 to three in 2018. As in 2017, 2018 saw Renew vehicles once again involved in three accidents due to the actions of non-Renew motor vehicle operators.

In 2018, Renew hosted an OSHA 30 hour safety class. This course led to the identification of several areas where Renew could improve safety and operations, to increase OSHA compliance and ensure personnel safety. Trauma Kits were assembled and are now issued whenever chainsaws and cut-off saws are signed out. The Confined Space Entry Program was reviewed and training was again presented for all affected personnel. Renew hosted “Stop the Bleed” and “Active Shooter” training, for all Renew personnel. All permit required confined spaces were identified and marked with appropriate signage. The Renew Facility Emergency Action Plan was revised and training for all Renew personnel was conducted on-site. A documentation and tracking system was implemented for tracking bloodborne pathogen exposure, along with a raw waste exposure policy.

In 2018, Renew personnel saw an increase in both vehicle and personal injury accidents. Vehicle operations training with an emphasis on turning and backing vehicles will again be needed in 2019. The winter of 2018, while providing plenty of very low temperatures, provided very little in the way of snowfall. Therefore, there was minimal snow plowing performed by Renew personnel which reduced the potential for vehicle accidents and associated personal injuries. Once again, considering the nature of the work engaged in by our employees and the number of vehicle miles logged by our fleet, our accident rate for the past year could be far worse.